PB85-213908

Superfund Record of Decision (EPA Region 5) Charlevoix Site, Michigan (Initial Remedial Measure), June 1984

(U.S.) Environmental Protection Agency
Washington, DC

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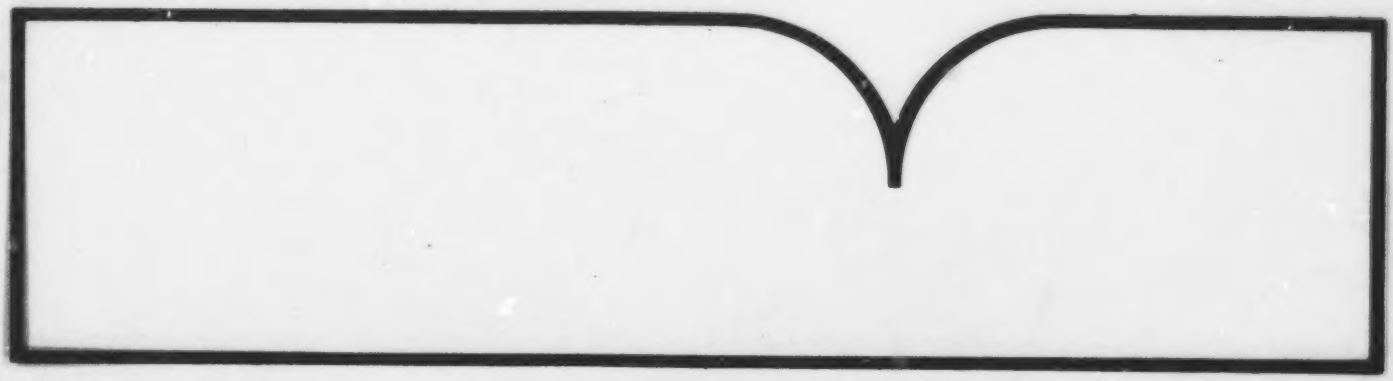

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA ROD R05-84-002
June 1984

PB85-213908

EPA

Superfund Record of Decision:

Charlevoix Site, MI (IRM)

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TECHNICAL REPORT DATA
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9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The site involves the city's single municipal well which supplies both the year-round and summer tourist populations. The well flumes collect ground water and lake water which are channeled into the system. Levels of TCE and PCE were detected in 1981, and have been gradually rising. Data available indicate that multiple sources of contamination are likely of historical origin at varying distances form the well.

The cost-effective Initial Remedial Measure (IRM) selected for this site includes: provide a safe permanent drinking water supply through conventional treatment of water from Lake Michigan, and to conduct an RI/FS to evaluate potential sources of contamination and the hydraulic characteristics of the aquifer. This IRM represents the First Operable Unit. The capitol cost for the IRM was estimated to be $1,954,000, with O&M costs of $118,000.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Charlevoix Site, MI Contaminated media: gw Key contaminants: solvents, VOCs, TCE, PCE		

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RECORD OF DECISION

INITIAL REMEDIAL ALTERNATIVE SELECTION

Site: Charlevoix Municipal Well, Charlevoix, Charlevoix County, Michigan

Documents Reviewed

I have reviewed the following documents describing the analysis of the cost-effectiveness of initial remedial action alternatives for the Charlevoix Municipal Well.

- Focused Feasibility Study, Charlevoix Municipal Well
- Public comments and recommendations
- Responsiveness summary

Description of Selected Remedy

- Construct a buried lake water intake line 1500 feet out from the present municipal well location into Lake Michigan.
- Construct a 2 million gallons per day direct filtration water treatment plant to provide water supply.

Declarations

Consistent with the Comprehensive Environmental Response Compensation and Liability Act of 1980, and the National Contingency Plan (40 CFR Part 300), I have determined that constructing a lake water intake line and filtration plant is a cost-effective initial remedial measure and provides adequate protection of public health, welfare, and the environment. The State of Michigan has been consulted and agrees with the approved remedy. In addition, the action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period not to exceed 1 year.

I have also determined that the action has been approved for funding from the Hazardous Substance Response Trust Fund.

The U.S. Environmental Protection Agency is continuing its remedial investigation/feasibility study of the Charlevoix Municipal Well to evaluate potential sources of contamination and the hydraulic characteristics of the aquifer in order to evaluate potential remedial actions. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of the future remedial action.

June 12, 1984
Date

Alan Levin (Acting)
Valdas V. Adamkus
Regional Administrator

Narrative Summary

Site Location and Description

The City of Charlevoix is located on the shores of Lake Michigan in the northwest section of the lower peninsula of Michigan in Charlevoix County (see Figure 1). The City's single municipal well supplies potable water to a year-round population of 3500 which increases to 5,000 during the summer tourist season. The City requires on an average basis a water supply of 0.76 MGD (million gallons/day), with a maximum demand of 2.0 MGD during peak periods. The municipal well is located in an urban setting. The primary use of the surrounding area is for residential, recreational and commercial purposes. A major portion of the City's income is derived from tourism.

The City's municipal well consists of a shallow large-diameter clear well connected to two 225-foot-long horizontal flumes which are buried under the beach of Lake Michigan parallel to the shore (see Figure 2 for detail). The flumes collect groundwater and lake water and channel it into the well, where it is then pumped into the distribution system. Approximately half of the water entering the flume comes from Lake Michigan, and the remainder from shallow groundwater sources.

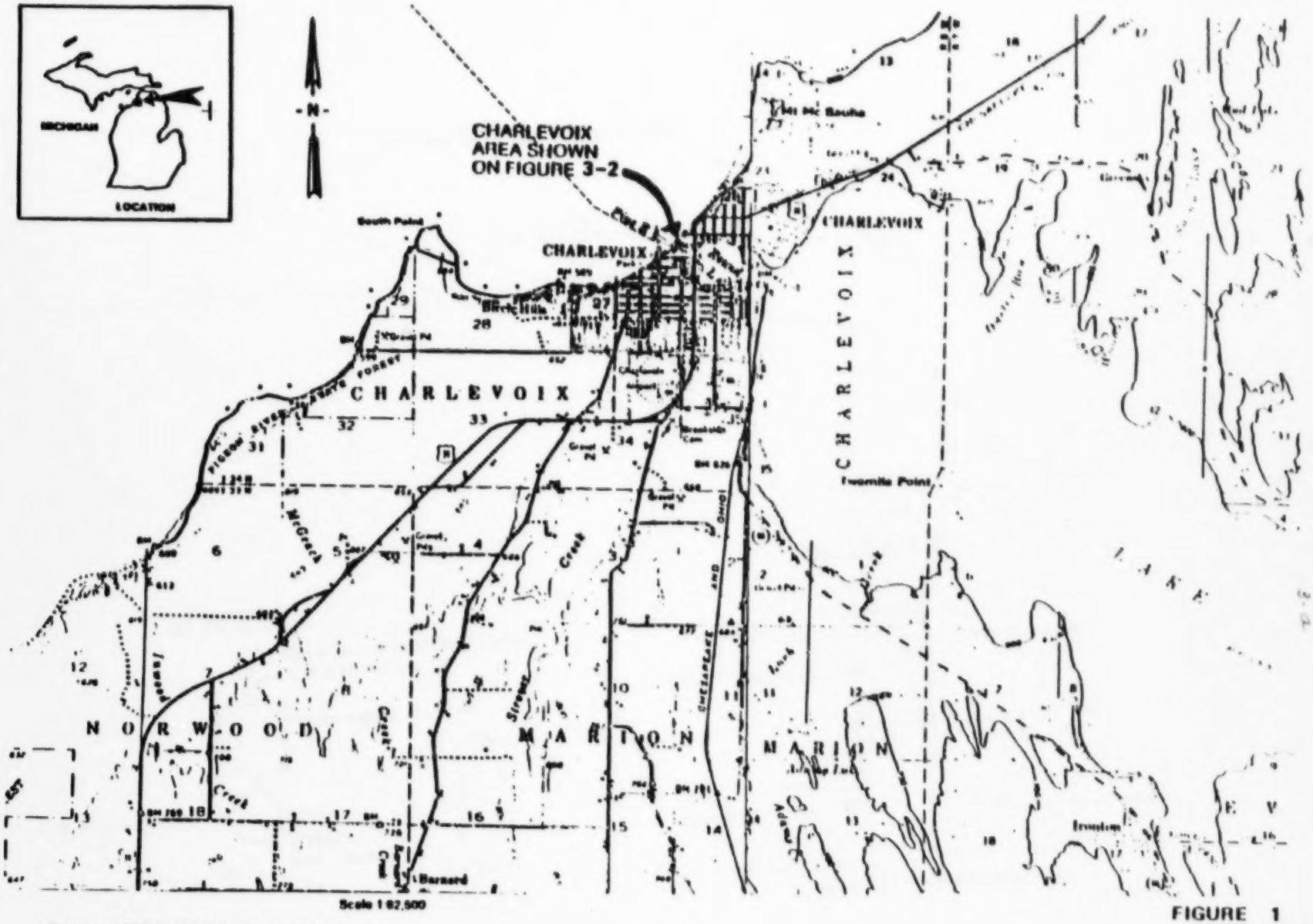
History

In September 1981, while conducting tests for trihalogenated methane compounds in the City's chlorinated water supply, the Michigan Department of Public Health (MDPH) detected trichloroethylene (TCE) ranging in concentrations from 13 to 30 parts per billion (ppb) in the Charlevoix water supply. A monitoring program was started and continued to detect gradually rising levels of TCE in the raw water intake.

In December 1982, concentrations of TCE exceeded 100 ppb. At that point, a temporary diffused aeration system was installed in the municipal well by the City to remove some of the volatile organic chemicals. The aeration system is able to remove 30 to 40 percent of the TCE, and it presently holds the concentration of TCE in the water supply system to below 50 ppb.

Several studies and investigations have been conducted or are underway in the area. In November 1981, the City of Charlevoix drilled four of the eventual six monitoring wells that it would install in its effort to identify the source and extent of TCE contamination in the aquifer. The four wells were placed around the City's pump station in hopes of intercepting the TCE contamination and establishing its direction of approach. It was the sampling results from these monitoring wells (well # T2, 36ppb TCE) that verified the source of TCE contamination as groundwater in the municipal well.

The EPA Technical Assistance Team (TAT) conducted a hydrogeologic study in June and July, 1982. The TAT developed nine groundwater monitoring wells in the vicinity of the municipal well. Although sampling of the test wells found varying amounts of TCE, the source of contamination could not be located. Also, during the TAT study perchloroethylene (PCE) was also detected in a number of the monitoring wells, although PCE had not been measured in the water supply.



Source: USGS 15 MINUTE QUADRANGLE:
CHARLEVOIX AND BAYSHORE

FIGURE 1
VICINITY MAP
CHARLEVOIX SITE

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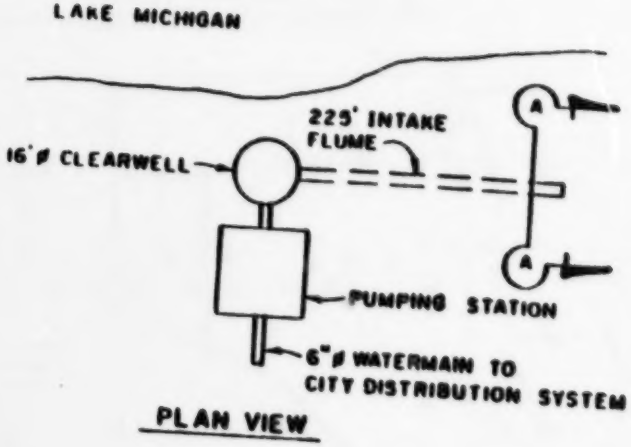

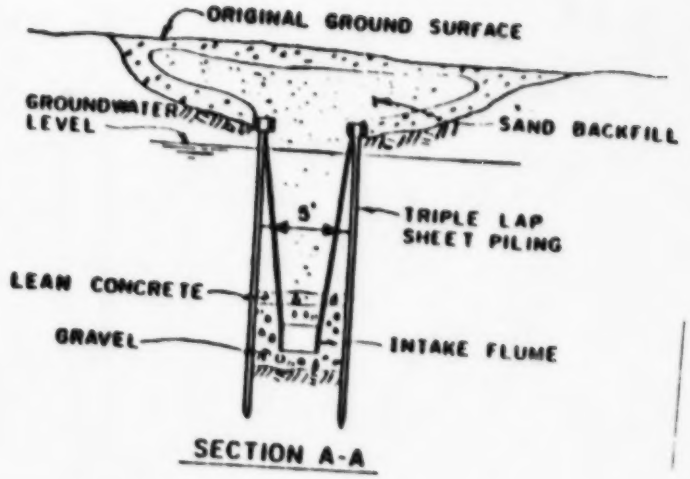

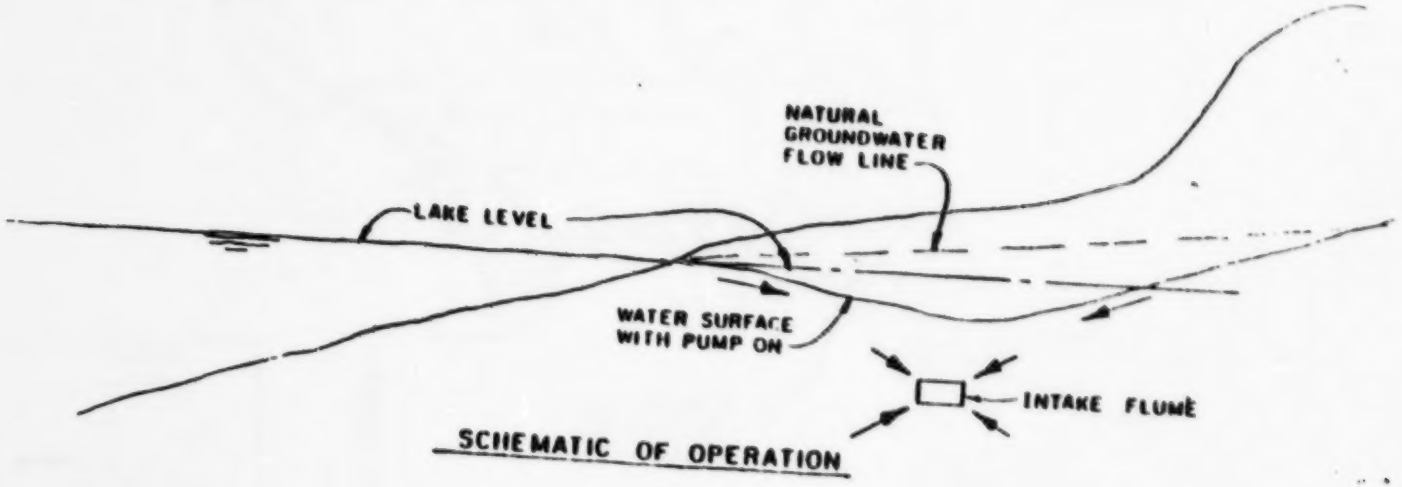

FIGURE 2.
CITY INTAKE FLUME
CHARLEVOIX SITE

The Charlevoix Municipal Well was listed as a National Priorities List site in August 1983.

The U.S. Environmental Protection Agency (EPA) began its remedial investigation during September 1983. Twelve additional borings were drilled in December 1983. Analysis of water samples taken from these monitoring wells has located areas of high concentration for both TCE and PCE. The exact sources for TCE and PCE are still unidentified, but suspected locations have been more closely defined by the data from the remedial investigation (see Figures 3 and 4). It is important to point out that although Figures 3 and 4 indicate a definite source for each contaminant, the contours are interpretive and do not illustrate the fact that in nearly every test well some level of contamination from both TCE and PCE was found. This would suggest that there are multiple sources at varying distances from the municipal well.

Since a quantified public health threat had been identified at the municipal well, and precise data on the source location(s) was not available, EPA and MDNR decided to prepare a Focused Feasibility Study (FFS) to evaluate potential remedies for the contaminated water supply, while work on the remedial investigation continued.

Enforcement

There have been no CERCLA related State or Federal enforcement activities at this site. There have not been any potentially responsible parties (PRP'S) identified, and cost-recovery actions are not anticipated at this time. The site has been classified as Fund lead with no responsible parties. The data available from the RI indicates that there are likely multiple sources of contamination, probably of historical origin at varying distances from the municipal well.

In August 1983, reacting to the continued presence of TCE in the City's water supply, MDPH issued a Departmental Order (order) to the City. The order required the City to commit by January 1, 1984 to a definite water supply alternative to replace or treat the contaminated municipal well. The issuance of this order coincided with EPA's initiation of a RI/FS. The January 1984 deadline did not allow sufficient time for EPA to perform the prerequisite field studies and alternatives evaluation prior to any Federal funding of a remedial solution to the water supply problem.

A November 17, 1983 meeting between EPA, MDPH and the City produced an agreement to delay the compliance date of the MDPH order until May 1, 1984 to allow sufficient time for EPA to complete the necessary remedial investigations. When EPA informed the MDPH in early May 1984 that the FFS would be completed on May 14, 1984 the MDPH decided to adjourn the hearing until late June 1984.

Current Situation

TCE and PCE have consistently been found in water samples taken from monitoring wells throughout the aquifer. Both of these volatile organic compounds (VOCs) are known animal carcinogens.

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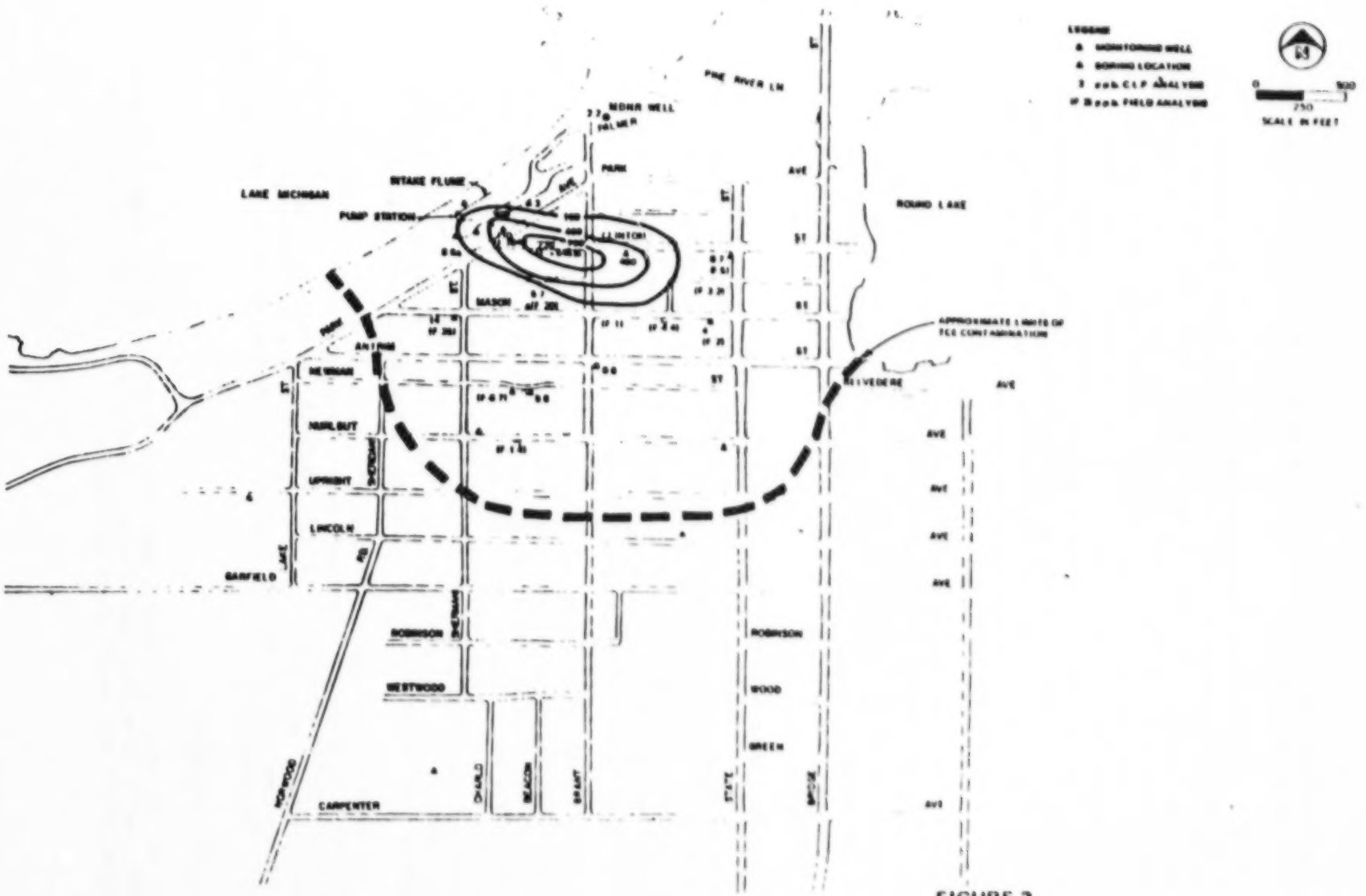

FIGURE 3
TRICHLOROETHYLENE CONCENTRATIONS
DECEMBER 1983
CHARLEVOIX SITE

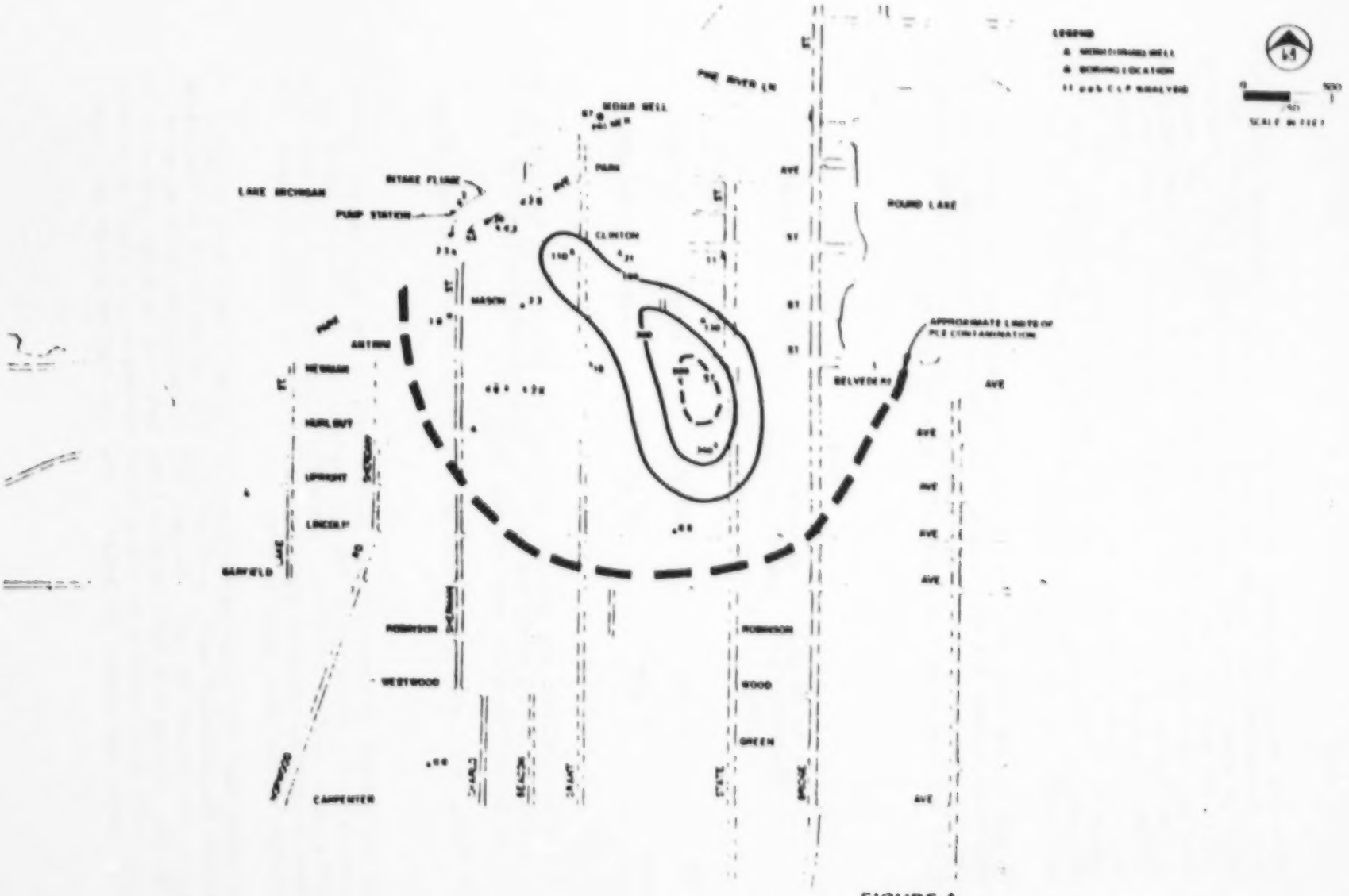

FIGURE 4
PERCHLOROETHYLENE CONCENTRATIONS (PPB)
DECEMBER 1983
CHARLEVOIX SITE

Since the initial discovery of the contamination in September 1981 (13-30 ppb), concentrations in the raw water reaching the municipal well have shown an upward trend with the present raw groundwater supply containing 100 to 200 ppb TCE. Mixing with lake water in the intake flume reduces this concentration about 50% and the temporary aeration system installed by the City in the clear well reduces the concentration an additional 30-40%. As a result, the water in the distribution system has stayed in the range of 30 to 50 ppb. PCE has not been detected in the water supply system at the present time. However, based on the preliminary data from the remedial investigation, it is expected to be detected in the municipal well within the next several months.

At present the City must rely on its single municipal well which is contaminated to meet its water needs. The present concentration of TCE in the distribution system is approximately 45 ppb. Table 1 lists concentrations and associated risk levels for both TCE and PCE.

Table 1

	Measured in Distribution System	Long-Term Health Advisory	Cancer Risk Level **	
			10^{-5}	10^{-6}
TCE	45 ppb	80 ppb	28 ppb	2.8 ppb
PCE	12 ppb*	20 ppb	7 ppb	0.7 ppb

* Although PCE has not yet been detected in the distribution system, this concentration is projected based on measured concentrations of PCE in the monitoring wells near the municipal well.

** These levels were established by U.S. EPA's Cancer Assessment Group.

At the present concentration of contaminants in the distribution system (see Table 1), the water at the tap presents a 3.3×10^{-5} risk based upon EPA's water quality criteria. Since the concentrations in the well have been increasing and conditions are not expected to remain the same, this represents the lower bound of risk.

Assuming that the contaminants shown in Figures 3 and 4 move directly toward the municipal well, eventual peak TCE concentration in the groundwater will exceed 700 ppb. The peak PCE concentration would be above 300 ppb. Mixing with lake water and the temporary aeration system in the clear well would combine to reduce those concentrations about 80 percent. Under these conditions, the water in the distribution system would pre-

sent a 2.4×10^{-4} risk according to EPA's water quality criteria. Because of the uncertainty associated with interpretation of the existing data, the actual risk could be even higher.

The FFS prepared by EPA in May 1984 concluded that the continued deterioration of the municipal well presents an unacceptable public health risk. As a result, an initial remedial measure (IRM) is necessary to provide an uncontaminated water supply for the City of Charlevoix.

Alternatives Evaluation

Several factors were considered during the evaluation of potential remedial alternatives for providing a safe water supply. The first was cleanup of the source itself, the actual cause of contamination leaching into the drift aquifer; second, treatment of the contaminated groundwater to provide a safe source of potable water; and third, relocation of the water supply to an uncontaminated source.

There are several limitations in evaluating these options:

- Lack of precise data on the source location(s).
- The volume or area of source(s).
- Whether the source(s) is still generating contamination.
- Knowledge of aquifer properties over a wide area rather than that provided by individual monitoring wells.

These are significant constraints that will be addressed during the continuing remedial investigation. However, assumptions had to be made in the FFS to evaluate alternative remedial actions.

Source control was the first approach considered. If it is assumed that a discrete source is located within the concentration contours in Figure 3, then the minimum distance of a source from the intake flume is about 1000 ft. At the velocity the contaminant moves, any action taken at the source would not be detected at the clear well for at least 9 years. Such an approach is unacceptable since levels of contamination in the distribution system would continue to increase over the next 9 years. Consequently, source control was not considered to meet the objectives of the IRM, which is to provide an uncontaminated source of potable water until a final remedial action can be implemented. The final remedial action would be implementated within 5 years of taking action.

The evaluation of source control made it clear that for those remedial options that rely on continued use of the contaminated aquifer for potable water supply, treatment of the groundwater would have to continue for some period of time exceeding 9 years. In order to determine that time period, the area and volume contaminated with TCE and PCE at levels above the 10^{-6} risk level were estimated. The direction and rates of groundwater flow and contaminant movement were then considered. It was assumed that 5 pore volume exchanges would need to occur before the aquifer would return to usable conditions. Under these conditions, 50 years are necessary. This is the minimum number of years that treatment would have to be provided at the municipal well, if continued use of the contaminated groundwater for water supply is considered, since pumping at the well to meet the City's water demand does not increase the natural rate of groundwater flow.

Alternatives for providing a safe water supply then fell into two categories: One approach was to develop new sources of water supply. The other approach relies on treatment of the contaminated groundwater.

During the initial phase of the FFS, the potential remedial options that had been identified were screened according to the following factors: 1) ability to protect human health; 2) time required to implement; 3) relative cost; 4) complexity; 5) environmental impact; and 6) community impact. Eight options were considered.

Table 2 summarizes these water supply alternatives and presents the results of the initial screening process. After the screening, three alternatives were judged to meet the objectives of the IRM and were evaluated further:

Alternative #1 - Relocate City water supply to a Lake Michigan buried intake line followed by a 2.0 MGD direct filtration treatment plant.

Alternative #2 - Treat 2.0 MGD with an air-stripping system at the existing municipal well.

Alternative #3 - Treat 2.0 MGD with a carbon adsorption system at the existing municipal well.

All three alternatives have been sized to treat the present maximum day demand (MDD) of the City. Based on 1983 water use records, the MDD is 2.0 MGD. The annual average day demand (0.76 MGD) has been used to calculate the annual operation and maintenance costs.

Table 2

INITIAL SCREENING OF WATER SUPPLY ALTERNATIVES - Screening Criteria

Alternatives	Ability to Protect Public Health	Time Required to Implement	Relative Cost	Complexity	Environmental Impact	Community Impact	Result of Initial Screening
A. No Action	Poor	N/A	Low	Low	N/A	High	Not Acceptable
New Supply							
H. Lake Michigan Supply (intake)	Good	15 months 6-8 months	Moderate	Moderate	Low	Low	Consider further
D. Water From Adjacent Facility	Good	9 months	Moderate	High	Low	Moderate	Eliminated
B. New Well Field	Good	1 year	Moderate	High	Low	Moderate	Eliminated
C. Bottled Water	Moderate	1 month	High	High	Low	High	Eliminated
Use Existing Well Supply							
E. Home Treatment Devices	Moderate	4 months	High	High	Low	High	Eliminated
G. Air Stripping	Good	5-6 months	Moderate	High	Low	Low	Consider further
F. Carbon Adsorption	Good	5-6 months	Moderate	High	Low	Low	Consider further

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The large difference in demand between seasons is due to the summer influx of seasonal residents.

The costs for each alternative have been evaluated for both 5 and 50 years. It has been assumed that 5 years will be required to implement the final remedial action. Treatment of the contaminated groundwater would have to continue for 50 years before the aquifer could be considered usable.

Alternative 1:

Alternative 1 is designed to supply the MDD of 2.0 MGD by pumping water from a buried screen intake 1,500 feet offshore in Lake Michigan. The intake screen would be backfilled with select grade granular material. The buried lake intake would provide some filtration and result in a reasonably low turbidity raw water supply.

The treatment configuration for the surface water would consist of chemical addition and flocculation followed by gravity filtration and chlorination. Table 3 summarizes the costs for this alternative.

Table 3

Cost for Lake Michigan
Surface Water Plant

Capital Cost	$1,954,000
Annual O & M	$ 118,000
5-year Present Worth	$2,395,000
50-year Present Worth	$3,068,000

Alternative 2:

Alternative 2 consists of constructing an air stripping tower at the existing municipal well site to treat the contaminated groundwater before it reaches the distribution system. The effluent from the air stripping tower must be at or below 2.8 ppb for TCE and 0.7 ppb for PCE. These concentrations will ensure adequate quality for potable use. Based on the estimated movement of the contaminant plumes and the projected TCE and PCE concentrations in the raw water supply the required removal rates are 99 + %.

Since air stripping is designed to remove VOCs from water by transferring them to an air stream, this alternative would create a source of air emissions. Michigan State law requires that any new source of volatile organic compounds be treated with Best Available Control Technology. This rule is incorporated in the State Implementation Plan prepared in

compliance with the Clean Air Act and is a Federally enforceable State environmental requirement.

Treatment of the tower vapor exhaust for removal of VOCs would be accomplished with a nonregenerable carbon adsorption system. A nonregenerable system has been selected because it is less complex and the costs compared to regenerable are relatively equal. Table 4 gives the cost information for this alternative.

Table 4

Treatment at Existing Water Supply
with an Air Stripping System

Capital Cost	$1,304,000
Annual O & M	$166,100 to 361,000
5-year Present Worth	$2,329,500
50-year Present Worth	$4,034,800

There is a range for annual O & M costs because the influent TCE and PCE concentrations, which affect the O & M costs, will vary each year as the contaminants migrate and are purged through the municipal well.

Alternative 3:

Alternative 3, like Alternative 2 relies on treatment of the contaminated groundwater at the existing municipal well to potable quality. Alternative 3 utilizes a carbon adsorption system to remove the VOC contamination. The carbon system would consist of four carbon columns arranged in two parallel duplicate flow streams. Two columns are used in each flow stream so that the carbon in the lead column can be fully exhausted, which optimizes carbon usage. On the average, carbon in one of the columns would have to be replaced every 4 to 5 months. The costs for Alternative 3 are summarized in Table 5.

Table 5

Treatment at Existing Water Supply
with a Carbon Adsorption System

Capital Cost	$1,815,000
Annual O & M	$120,000 - 275,000
5-year Present Worth	$2,590,000
50-year Present Worth	$3,934,000

Summary:

Each of the three alternatives are technically feasible. All three would require at least 6 months for implementation and all three were judged to be equally low in potential for community impact.

When evaluated over the short-term (5 years) the alternatives are essentially equivalent in cost. When the need for continued long-term (50 years) treatment of the groundwater after implementation of source control measures is considered, assuming that groundwater would provide the water supply, Alternative 1 is least costly. Each alternative would provide the City enough water to meet the present maximum daily demand of 2.0 million gallons per day.

Alternative 2 has a greater risk for environmental impact, due to the potential for the release of VOCs to the atmosphere during the treatment process. It is the most complex to operate and requires air emission controls.

Alternative 3 also would be complex to operate; monitoring is required to predict contaminant breakthrough in the carbon beds.

Alternative 1 is considered a conventional form of water treatment. Lake Michigan provides a constant, dependable source of drinking water and operation of this facility would not present any complex operational problems. All alternatives are designed to adequately protect public health. However, Alternative 1 might provide the greatest protection since Alternative 2 and 3 may still have detectable levels of VOCs in the water after treatment. Consequently, Alternative 1 is recommended as the most cost-effective remedial action.

Summary of Costs

	Alternative 1	Alternative 2	Alternative 3
Capital Cost, $	1,954,000	1,304,000	1,815,000
Annual O & M, $	118,000	166,100-361,000	120,000-275,000
5-year Present Worth, $	2,395,000	2,329,500	2,590,000
50-year Present Worth, $	3,068,000	4,034,800	3,934,000

Community Relations

Copies of the FFS were made available to the community on May 14, 1984. Three locations served as repositories within the City: Charlevoix City Hall, District Health Department No. 3 and the Charlevoix Public Library. The EPA issued a press release on May 14 which announced the availability of the study and the commencement of the 2-week public comment period. EPA also placed an advertisement in the Charlevoix Courier regarding the public comment period and schedule for a public meeting.

The public meeting was held on May 22, 1984 at the Charlevoix City Hall. Approximately 30 residents attended the meeting. Representatives of the EPA, MDNR, MDPH and local government were present. The EPA presentation explained the purpose of the FFS, described the current situation regarding contamination of the aquifer, and the alternative being recommended by EPA. Questions regarding the project were also answered. The public comment period ended on May 29, 1984. The responsiveness summary is attached to this Narrative Summary.

Consistency With Other Environmental Laws

The proposed action will not require on-site treatment, storage or disposal of hazardous wastes. Therefore, there are no issues involving the consistency of on-site actions with RCRA.

The air stripping alternative would create an air emission of VOCs. These emissions would be treated to remove the pollutants before being discharged. This would comply with the provisions of the Michigan State Implementation Plan.

Construction of the lake water intake line component of Alternative 1 will require a permit under the State's Great Lakes Submerged Lands Act, and Department of the Army permits required by Section 10 of the Rivers and Harbours Act and Section 404 of the Clean Water Act. The City of Charlevoix has applied for and been granted these permits for construction of the lake water intake.

Recommended Alternative

The National Oil and Hazardous Substances Contingency Plan (NCP) [40 CFR Part 300.68(j)] states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial measure which the agency determines is cost-effective (i.e., the lowest cost alternative that is technologically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment. Based on the evaluation of the cost and effectiveness of each proposed alternative, the comments received from the public and the MDNR, and State and Federal

environmental requirements, Alternative 1 has been determined to be cost-effective as defined by the NCP.

The recommended alternative is considered an off-site remedial action (provision of a permanent alternative water supply), as defined in section 300.68(e) of the NCP. The objective of the action is to provide a safe drinking water supply to meet the City's present needs, until such time that final remedial measures may be implemented. The RI/FS currently underway will examine appropriate final response actions.

The capital cost of this alternative is estimated to be $1,954,000. The operation and maintenance costs are estimated to be $118,000 per year. The 5-year present worth value for the selected alternative is $2,395,000.

We recommend that EPA fund 90 percent of the O & M costs for a period not to exceed one-year after completion of construction. The City of Charlevoix will provide the 10% O & M match for the first year and then assume all O & M costs for the life of the project.

Schedule

The Omaha District of the U.S. Army Corp of Engineers (COE) will manage the design and construction of the remedial action under an Interagency Agreement (IAG) with EPA.

Under an existing IAG for technical support during the FFS, EPA tasked the COE to conduct a technical review of plans and specifications for a lake water intake structure that the City of Charlevoix had previously prepared. This review has been completed and the COE has concluded that with minor design changes and modifications to the bid package, the COE can use this design to advertise and award a construction contract for the intake structure. The schedule for this activity is as follows:

Approve Remedial Action (sign ROD)	6/8/84
Award Superfund State Contract	6/8/84

IAG with Omaha District COE	6/8/84
COE assembles specifications front end and makes design revisions	6/13/84
COE completes design/specification revisions	6/29/84
Notice to Bidders	7/2/84
Advertise for Competitive Bids	7/10/84
Bid Opening	8/9/84
Contract Award	8/21/84
Notice to Proceed	9/3/84
Estimated Construction Period	90 days

At the same time that procurement of a contractor for construction of the intake structure is taking place the COE will initiate procedures for selecting an Architect/Engineering firm to prepare a design for the direct filtration treatment plant. The plant facilities could be completed and ready for startup within 15 months after starting the design.

Future Actions

A RI/FS is underway. The Phase 1 drilling program in the remedial investigation has more closely defined a probable area where the source(s) of contaminants are located. Phase II work will begin within one month. Phase II will include soil borings and possibly additional monitoring well installation in the suspected source location. The feasibility study should be completed by fall 1984.

17

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF

JUN 12 1984

Mr. Gary E. Guenther
Deputy Director
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, Michigan 48909

Dear Mr. Guenther:

Enclosed is an executed copy of the Superfund State Contract for an Initial Remedial Measure at the Charlevoix Municipal Well Site, Charlevoix, Michigan.

The U.S. Environmental Protection Agency has determined that constructing a Lake Michigan intake line and direct filtration water treatment plant at Charlevoix is a cost-effective initial remedial measure which will limit the threat of exposure from a significant health and environmental hazard. The documentation supporting our decision is enclosed.

We look forward to working with you to implement this initial remedial measure at Charlevoix. Please call me if you have any questions.

Sincerely yours,

Alan Levin (Acting)

Valdas V. Adamkus
Regional Administrator

Enclosures

SUPERFUND STATE CONTRACT FOR AN INITIAL REMEDIAL MEASURE AT CHARLEVOIX MUNICIPAL WELL SITE BETWEEN THE STATE OF MICHIGAN AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

A. Authority

This Contract is entered into pursuant to Sections 104(a)(1),(c)(2),(c)(3), and (d)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601 et seq.

B. Purpose

1. This Contract is an agreement between the United States Environmental Protection Agency (U.S. EPA) and the Michigan Department of Natural Resources (MDNR) on behalf of the State of Michigan (the State) to undertake an Initial Remedial Measure (IRM) at the Charlevoix Municipal Well (site).

2. Attached is Appendix A and incorporated herein is a description of the site.

3. Attached is Appendix B and incorporated herein is a Statement of Work (SOW) to be performed under this Contract. This Contract may be amended if the parties agree to undertake additional remedial action beyond the scope of the SOW.

4. The purpose of this Contract is to delineate the responsibilities of the parties and provide the assurances required by CERCLA.

5. This Contract will become effective upon execution by the State and U.S. EPA and shall remain in effect until completion of activities described in the SOW including the State's assurances for all future operation and maintenance (O&M).

C. Parties

1. This Contract is entered into by the U.S. EPA and the MDNR. MDNR has the legal authority to enter into and to fulfill the terms of this Contract on behalf of the State as certified by the Governor.

2. U.S. EPA has designated Jack Kratzmeyer, Environmental Scientist and Federal On-Scene Coordinator, 230 South Dearborn Street, Chicago, Illinois 60604, (312) 886-1435 to serve as Regional Site Project Officer (RSPO) of this Contract.

3. The State has designated Thrasos Eftaxiadis, Geologist, MDNR, Groundwater Quality Division, Remedial Action Section, P.O. Box 30028, Lansing, Michigan 48907, (517) 373-9892 to serve as Project Coordinator for this Contract.

4. The Regional Site Project Officer in consultation with the State Project Coordinator is authorized to make decisions that do not enlarge the scope of the SOW or increase the cost of the project.

D. U.S. EPA Responsibilities

1. In addition to its obligations in paragraph G, U.S. EPA shall arrange for the services of a contractor to perform Task I in the SOW. U.S. EPA shall, at its own cost and expense, furnish the necessary personnel, materials, services, and facilities to perform its other responsibilities under this Contract.

2. U.S. EPA shall consult with the State on matters relating to the implementation of the work described in the SOW.

E. State Responsibilities

1. In addition to its obligations under Sections G and I, the State shall at its own cost and expense, furnish the necessary personnel, materials, services and facilities to perform its responsibilities under this contract. None of the expenses incurred by the State in performing these other responsibilities will be paid for or be reimbursed from the Hazardous Substance Response Trust Fund established by Section 221 of CERCLA, nor counted toward any cost-sharing requirements under this contract or any future contracts or cooperative agreements relating to this site.

2. The State to the extent of its legal authority will assure that any state and local permits that are necessary to implement the activities described in the SOW are obtained and shall assist U.S. EPA in obtaining any Federal permits.

F. Immediate Removal Action

The terms of this contract shall not restrict any immediate removal activities conducted pursuant to the National Contingency Plan, 40 CFR, Part 300.65. The U.S. EPA, in consultation with the State, can suspend the activities described in the SOW during any immediate removal actions.

G. Payment

1. U.S. EPA shall pay 90 percent of the total capital costs of those actions described in the SOW. The Director of the MDNR, by his signature to this contract, hereby assures that the State shall pay 10 percent of the costs of those actions described in the SOW.

2. The estimated total capital cost of the initial remedial measure, which includes Task I only, as reflected in the SOW is 1.954 million. The State share of this estimated cost is $195,400. The cost of the actions in the SOW shall not exceed $1.954 million unless this Contract is amended pursuant to Paragraph R. Any such amendment shall provide payment terms for the State's additional cost share.

3. The State shall pay its full estimated share within 60 days after execution of this contract.

4. When the IRM is complete, the final cost will be determined by U.S. EPA and any refund by U.S. EPA to the State or additional payment by the State to U.S. EPA will be made within 90 days of such final cost determination.

5. All payments shall be made payable to U.S. EPA and sent to:

U.S. EPA
Accounting Operations
P.O. Box 2971
Washington, D.C. 20013
Attention: Collection Officer for Superfund
Kevin Brittingham, PM-226
Room 3419M

H. Off-Site Storage, Destruction, Treatment or Disposition

No off-site treatment, storage or disposal is anticipated as part of this contract. However in the event that the State and U.S. EPA enter into an agreement to take additional remedial actions for which off-site treatment and disposal is required, the State shall provide the assurances required under CERCLA Section 104(c)(3)(B).

I. Operation and Maintenance (O&M)

1. Pursuant to CERCLA Subsection 104(c)(3)(A), to the extent permitted by law, the State shall provide all future O&M of the remedial actions for the expected life of such actions. However the U.S. EPA will provide 90% of the cost of the first year O&M in accordance with item 2 of this section. The State will secure the necessary funds from the City of Charlevoix to perform its obligations under this Contract, or in the event that the City defaults the State will make every applicable request to the legislature to secure adequate funds to perform its obligations. MDNR will promptly notify U.S. EPA if the City defaults, and the legislature fails to appropriate adequate funds to meet MDNR's O&M responsibilities.

2. Pursuant to current Superfund policy, as referenced in the "State Participation in the Superfund Remedial Program" document, February, 1984, at the completion of Tasks I of the SOW, MDNR and U.S. EPA shall enter into a cooperative agreement whereby the U.S. EPA shall pay 90% and the State shall pay 10% of the costs associated with the first year of O&M for the IRM.

J. Future Payment

If U.S. EPA and the State agree to take remedial action in addition to the actions described in the SOW, the State shall contribute 10 percent of the cost of such remedial action.

K. Personnel Safety

U.S. EPA or its contractors shall develop and oversee the implementation of the site safety plan.

L. Access to the Site

1. The State to the extent of its legal authority shall secure access to the site for U.S. EPA or its contractors to complete the actions described in the SOW.

2. With advance notice and the approval by the RSPO, representatives of the State shall have access to the site to review work in progress.

3. U.S. EPA shall not be responsible for any harm to any State representative or other person arising out of, or resulting from any act or omission by the State in the course of an on-site inspection.

4. The State shall not be responsible for any harm to any U.S. EPA representative or other person arising out of, or resulting from any act or omission by the U.S. EPA in the course of an on-site inspection.

M. Availability of Information

1. At U.S. EPA's request, the State shall make available any information in its possession concerning the site, pursuant to State law. If said information was submitted by the State under a claim of confidentiality, said information shall be treated in accordance with 40 CFR 2. Absent such a claim, U.S. EPA may make said information available to the public without further notice.

2. At the State's request and in accordance with Federal law, U.S. EPA agrees to share information and reports developed as part of its responsibilities under this contract. The State agrees not to release any information or reports prepared pursuant to this contract to the public, unless approved by both U.S. EPA's Region V Office of Regional Counsel and the State Project Coordinator.

N. Community Relations Plan

U.S. EPA and the State have jointly developed a Community Relations Plan which U.S. EPA shall implement in carrying out the SOW.

O. Third Parties

1. This contract is intended to benefit only the State of Michigan and U.S. EPA. It extends no benefit or right to any other party.

2. U.S. EPA does not assume any liability to third persons for losses due to bodily injury or property damage that exceeds the limitations contained in the provisions of 28 U.S.C. Sections 1346(b), 2671-2680. To the extent permitted by State law, the State does not assume liability to any third persons for losses due to bodily injury or property damage.

P. Negation of Agency Relationships

Nothing contained in this Contract shall be construed to create, either expressly or by implication, the relationship of agency between U.S. EPA and the State. Any standards, procedures or protocols prescribed in this contract to be followed by U.S. EPA contractors during the performance of its obligations under this contract are for assurance of the quality of the final product of the actions contemplated by this contract, and do not constitute a right to control the actions of U.S. EPA. U.S. EPA (including its employees, agents, and contractors) is not authorized to represent or act on behalf of the State in any matter relating to the subject matter of this contract, and the State (including its employees, agents and contractors) is not authorized to represent or act on behalf of U.S. EPA in any manner relating to the subject matter of this contract.

Q. Enforcement and Cost Recovery

1. U.S. EPA and the State agree that, with respect to the claims which each may be entitled to assert against any third persons (herein referred to as the "responsible party", whether one or more) for reimbursement of any services, materials, monies or other thing of value expended by U.S. EPA or the State for response activity at the site described in this Contract, neither U.S. EPA nor the State will enter into a settlement with or initiate a judicial or administrative proceeding against a responsible party for the recovery of such sums except after having given notice in writing to the other party to this Contract not less than (30) days in advance of the date of the proposed settlement or commencement of the proposed judicial or administrative proceedings. Neither party to this Contract shall attempt to negotiate for or collect reimbursement of any response costs on behalf of the other party, and authority to do so is hereby expressly negated and denied.

2. U.S. EPA and the State agree that they will cooperate in and coordinate efforts to recover their respective costs of response actions taken at the site described herein, including the negotiaton of settlement and the filing and management of any judicial actions against potentially responsible parties. This shall include coordination in the use of evidence and witnesses available to each in the preparation and presentation of any cost recovery action, excepting any documents or information which may be confidential under the provisions of any applicable State or Federal law or regulation.

3. U.S. EPA and the State agree that any judicial action taken by either party pursuant to CERCLA against a potentially responsible party for recovery of any sums expended in response actions at the site described herein shall be filed in the United States District Court for the Judicial District in which the site described in the Contract is located, or in such other Judicial Districts of the United States District Courts as may be authorized by Section 113 of CERCLA, and agreed to in writing by the parties to this Agreement.

4. Signature of this Contract does not constitute a waiver of U.S. EPA's right to bring an action against any person or persons for liability under Section 106 or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or any other statutory provision or common law.

R. Amendments

Any modifications to this Contract must be agreed to, in writing, by both parties.

S. Resolution of Disputes

1. Any disagreements arising under this Contract shall be resolved to the extent possible by the U.S. EPA Regional Site Project Officer and the State Project Coordinator.

2. If any such disagreement cannot be resolved by the U.S. EPA Regional Site Project Officer and the State Project Coordinator, it shall be referred to the Regional Superfund Director for a final resolution in accordance with the requirements of Subpart L of 40 CFR Part 30. For the purposes of resolving disputes under this Contract, the Director is the disputes decision official provided for in Subpart L.

3. The decision of the disputes decision official will constitute the final agency action unless MDNR files a request for review of that decision with the Regional Administrator, U.S. EPA, Region V in accordance with the requirements of Subpart L of 40 CFR Part 30.

4. If the Regional Administrator confirms the decision of the disputes decision official, MDNR may seek review from the Assistant Administrator, OSWER, U.S. EPA, in accordance with the requirements of Subpart L of 40 CFR Part 30.

T. Termination of the Contract

1. The parties may enter into a termination agreement which will establish the effective date for the termination of this Contract, the basis for settlement of termination costs and the amount and date of any sums due either party. Such settlement costs will include all project costs incurred, as well as any close-out costs.

2. If at any time during the period of this Contract, performance of either all or part of the work described in the SOW is voluntarily undertaken, or undertaken for any other reason by persons or entities not party to this Contract, this Contract will be modified or terminated as appropriate to allow these actions and, upon modification or termination, shall relieve the parties of further duties to perform those actions undertaken by persons or entities not party to this Contract.

3. This Contract remains in effect until all activities described in the SOW have been completed.

In witness whereof, the parties hereto have executed this Contract in two (2) copies, each of which shall be deemed an original.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Alan Levin (Acting)
Regional Administrator Date 6/12/84

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

James F. Clegg
Deputy Director Date 6/6/84

ATTACHMENT A

Site Description: Charlevoix Municipal Well

The City of Charlevoix is located in Northern Michigan in Charlevoix County on the shores of Lake Michigan. The City's single municipal well supplies potable water to a year-round population of 3,500 which increases to 5,000 during the summer tourist season. The City requires on an average basis a water supply of 0.76 MGD (million gallons/day), with a maximum demand of 2.0 MGD during peak periods.

The City's municipal well consists of a shallow, large-diameter clear well connected to two 225-foot-long horizontal flumes that are buried under the beach of Lake Michigan parallel to the shore. The flumes collect groundwater and lake water and channel it into the well, where it is then pumped into the distribution system. Approximately half of the water entering the flume comes from Lake Michigan, and the remainder from shallow groundwater sources.

In September 1981, the Michigan Department of Public Health (MDPH) detected trichloroethylene (TCE) ranging in concentrations from 13 to 30 parts per billion (ppb) in the Charlevoix water supply. A monitoring program was begun and continued to detect gradually rising levels of TCE in the raw water intake. In December 1982, concentrations of TCE exceeded 100 ppb. At that point, a diffused aeration system was installed in the caisson to remove some of the volatile organic chemicals. The aeration system is able to remove 30 to 40 percent of TCE, and it presently holds the concentratiion of TCE in the water supply system to below 50 ppb.

The site was placed on the National Priorities List dated August 1983. U.S. EPA, Region V began a remedial investigation and feasibility study at the site in September 1983. At that time data available from monitoring wells installed by EPA's Technical Assistance Team (TAT) indicated that the aquifer contamination was wide-spread and at low levels, which suggested multiple sources of contamination. Since a quantified public health threat had been identified at the municipal well, and precise data on the source location(s) was not available, Region V EPA and MDNR decided to prepare a Focused Feasibility Study (FFS) to evaluate potential remedies for the contaminated water supply, while work on the remedial investigation continued. The analysis contained in the May 1984 FFS forms the basis of the initial remedial measure (IRM) funding request.

The National Contingency Plan states that IRMs can and should begin if they are determined to be feasible and necessary to limit exposure or threat of exposure to a significant health or environmental hazard, and if they are cost-effective (40 CFR 300.68(e)(1). Based on the conclusions of the endangerment assessment contained in the FFS, Region V EPA and the Michigan Department of Natural Resources (MDNR) believe that the present levels of TCE (40 ppb) in the municipal well represent exposure to a significant health hazard to the residents of the City of Charlevoix, that requires an IRM as described in the Statement of Work (Attachment B).

ATTACHMENT B

Statement of Work: Charlevoix Municipal Well

TASK I - Construction of a Surface Water Direct Filtration Treatment Plant. The components would be designed to treat the present maximum day demand (MDD) flow rate of 2.0 MGD. The major components and processes are listed below:

- Raw water lake intake
- Low service raw water pumps
- Chemical feed system
- Rapid mix tank
- Flocculation basins
- Gravity Filters
- Backwash pumps
- Finished water pumps
- Laboratory
- Clear well storage
- Operations and Maintenance building

The construction will be phased. Phase I will consist of construction of the buried intake and in-line chlorination. The chlorine contact/clear well storage reservoir and the unit processes required for the direct filtration plant would be constructed as Phase II. The total capital costs including engineering, legal, administration and contingency costs is $1,954,000.

First year operation and maintenance (O&M) costs will be covered under a cooperative agreement between the State and U.S. EPA, at the completion of construction of the IRM. Annual O&M costs are estimated to be $118,000.

The U.S. Army Corps of Engineers (COE) will manage the design, construction and related activities for the remedial action described in the SOW. The COE project activities are valid remedial response costs and therefore are subject to the cost sharing requirements of CERCLA Section 104(c)(3). The State shall contribute 10 percent of the cost of the COE's services during design and construction of the remedial action described in the SOW. When the final costs for the COE's services have been determined, this Contract will be amended pursuant to Paragraph R. Any such amendment shall provide payment terms for the State's additional cost share.

COMMUNITY RELATIONS RESPONSIBILITIES SUMMARY
CHARLEVOIX MUNICIPAL WELL
CHARLEVOIX, MICHIGAN

INTRODUCTION

This "Community Relations Responsivness Summary" documents citizen concerns and issues raised during the planning and preparation of the focused feasibility study for initial remedial measures at the Charlevoix Municipal Well, Charlevoix, Michigan. It also documents, for the public record, the U.S. Environmental Protection Agency's (USEPA) response to the comments presented during the public comment period on the focused feasibility study.

CONCERNS RAISED DURING THE COMMENT PERIOD

The focused feasibility study (FFS) was completed on May 11, 1984. Copies of the FFS were made available to the community on May 14, 1984. A public meeting was held at the Charlevoix City Hall on May 22, 1984, to present the FFS and solicit public comment. The public comment period closed on May 29, 1984.

Approximately 30 residents attended the public meeting. After the Agency's presentation, 5 attendees made public statements regarding the proposed alternatives. The Agency subsequently received 4 written statements regarding the proposed initial remedial measures. Written comments include letters from the District Health Department No. 3, the Michigan Department of Public Health and two area residents.

ISSUE: Feasibility of Drilling New City Wells

A number of residents expressed dissatisfaction with the City's test well drilling program and EPA's decision to eliminate this alternative from further consideration during the initial screening phase of the FFS.

1. COMMENT: The City did not conduct the test well drilling program properly.

   RESPONSE: Early on in the preparation of the focused feasibility study, when the initial list of potential remedial actions for water supply was developed, drilling new wells in the uncontaminated limestone aquifer was thought to be a highly feasible option. For this reason, the City initiated an exploratory drilling program in hopes of locating an area in the aquifer where new production wells could be developed. Both the quantity and quality of water from groundwater sources must be considered when making decisions about the suitability of a groundwater-based water supply.

   The City drilled 17 test wells at 10 different sites on both the north and south sides of town. USEPA was not involved in the planning or execution of the drilling program. However, we have reviewed a preliminary report prepared by the City on the results of the test well drilling, and have concluded that none of the well sites developed are suitable for water supply, considering yield and/or quality requirements.

Based upon the available test well data, a city water supply totally derived from groundwater would require installation of a minimum of 8 to 10 wells. Some of these wells would require treatment including iron removal, sulfate removal, and softening to meet State water quality standards. Operation of this system would be difficult because of the scattering of well fields and possible treatment facilities required.

Considering the results of the City's drilling program in the context of the FFS and the evaluation of remedial actions for water supply, we do not believe further well exploration should be undertaken. The Agency relied on the best professional judgment of geologists employed by EPA and its consultants in the development of the alternatives. In our judgment, there is no advantage to continuing well exploration, which would delay implementation of a solution to the water supply problem and prolong the exposure to TCE and potential PCE contamination, when a plentiful supply of high quality water is readily available from Lake Michigan.

Because of the uncertainty associated with development of a new city water supply and the complexity of operating and maintaining several wells scattered around the city, this alternative is considered an undesirable solution to the City's water supply problem. Our estimate of the 5-year present worth cost for drilling new city wells was $3.5 million, approximately 30% more costly than the recommended surface water supply.

ISSUE: EPA Should Evaluate an Additional Alternative

1. COMMENT: A water treatment system that is used in Dosebacka, Sweden, would be an effective method to provide potable water for Charlevoix.

2. RESPONSE: The Agency considered a full range of alternatives to address the water supply contamination problem during preparation of the FFS. Early in the process, EPA solicited comments on an initial list of potential remedial actions from interested Federal, State and local authorities.

   The range of alternatives were evaluated against a screening criteria that included: 1) ability of alternative to protect the public health; 2) time required to implement; 3) relative cost; 4) complexity; 5) environmental and community impact. The comments received from the interested parties were factored into the FFS. Three primary alternatives were identified, which subsequently received a more detailed evaluation. The FFS concluded that alternative 1, Lake Michigan Water Supply is the cost-effective remedial action. We strongly believe that there is not a need to evaluate additional alternatives to address the water supply comtamination problem. Such a step would cause needless delay in the implementation of an initial remedial measure to provide an uncontaminated water supply. Our position on this issue does not reflect a value judgment on the merits of the water treatment scheme proposed by the residents. We recognize that there are other feasible alternatives

that could address the water supply contamination problem. However, the Agency is confident that the recommended alternative (Alternative 1) is technologically feasible and reliable and will provide for the adequate protection of public health.

ISSUE: Water Supply System Demand Rates

1. COMMENT: The maximum day demand (MDD) flow specified in the FFS is too low, since it does not correlate to actual 1983 water use figures.

RESPONSE: The MDD of 1.8 million gallons/day (MGD) referenced in the FFS was taken from previous engineering studies prepared by the City. The FFS incorrectly identified this flowrate as representative of 1983-84 water system demand rates. In reality, the MDD of 1.8 MGD was based on 1982 pumping records. The MDPH and the City have both provided the EPA with the actual pumping records for the water supply system for 1983. We have reviewed those pumping records and agree that a MDD of 1.8 MGD does not accurately represent the peak demand. Given the 1983 pumping records, the Agency has revised its estimate of the existing MDD to 2.0 MGD.

The MDPH also commented on specific design issues related to Alternative 1. These comments will be forwarded to the U.S. Army Corps of Engineers (COE), Omaha, for consideration during the detailed design phase of the project.

CONCERNS RAISED DURING PRE-MEETING

A pre-meeting was held at the Charlevoix City Hall on May 22, 1984, prior to the evening public meeting. The pre-meeting was attended by City officials and the various local, State and Federal agencies that have been involved in investigating the water supply contamination problem. EPA outlined for these interested parties the findings of the FFS and described the recommended remedial action.

Although the City and the MDPH expressed complete support for Alternative 1, areas of disagreement over specific aspects of this alternative as recommended by EPA were surfaced. One such area of disagreement concerned the proper design capacity for the filtration plant. Since the recommended initial remedial measure involves the permanent relocation of a water supply, considerations of design and corresponding future capacity needs are relevant. EPA emphasized that it would only provide funding for capacity to supply existing population at risk from the TCE contamination. The FFS defined that capacity as the maximum daily demand based on 1983 pumpage records, or 1.8 MGD. This number has been revised to 2.0 MGD. The Agency can utilize the Hazardous Substance Response Trust Fund (Fund) to implement only those measures found necessary to protect human health and the environment. Fund monies are not to be used to pay for expansion or capacity for future populations.

However, this does not preclude the City from paying for incremental capacity in excess of the MDD. The City did not indicate to EPA its intentions regarding the amount of incremental capacity it would seek.

The City manager indicated that the City had previously done a sensitivity analysis on plant capacity that had shown that, on a present worth cost basis, a 2.4 MGD plant was cheaper than a 1.8 MGD plant because of higher labor costs for the smaller plant. The City manager was not familiar with the details of the analysis, however, he felt that the analysis was sufficient to justify EPA's providing funding for a 2.4 MGD design capacity.

EPA responded that it would review the study if the City would make it available before the end of the comment period. After the close of the comment period, the City did provide a 2-page cost summary of the analysis. We faced several limitations in evaluating the information supplied by the City:

- Capital costs for a 2.4 MGD plant had not been prepared by EPA, so the accuracy of those provided by the City could not be verified.

- An 8% interest factor was used compared to 10% in the FFS; lower interest rate favors a higher capital cost project.

- The City's present worth analysis was based on 20 years; the alternatives in the FFS were evaluated for a 5-year period. A longer time period favors a higher capital project.

The sensitivity analysis prepared by the City focused on the number of shifts that would have to be run during summer and winter to meet the average demand and the resulting personnel cost component of annual operating costs. The total percent worth cost for a 2.4 MGD plant size is shown to be lower than that for a 1.8 MGD plant.

This Agency ran two checks on the analysis, using the same assumptions made by the City regarding operating mode, average demand during summer/winter and interest rate and period. In the first check a 2.0 MGD capacity plant was compared to a 2.4 MGD. The personnel costs for these two plant sizes do not significantly favor the larger plant, since for both plant sizes the average winter demand can be met with one shift. As a result, the total present worth for a 2.0 MGD plant is lower than that for the 2.4 MGD plant. As a second check, the time period was shortened from 20 years to 5 years (i.e., the basis of cost-effectiveness analysis in the FSS), and a comparison was made between a 1.8 and 2.4 MGD plant size using the capital and O & M costs in the City's study. In this case, the total present worth cost for the 1.8 MGD plant size was lower.

Based on our review of the information supplied by the City, we do not believe that the plant's present worth can be reduced by increasing the capacity from 2.0 MGD to 2.4 MGD.

Another area of discussion at the pre-meeting concerned the phased construction of Alternative 1. The MDPH correctly pointed out that Phase 1 of construction would not consist of the elements as described in the FFS. The FFS included construction of the chlorine contact/clear well storage reservoir as part of the first stage of construction, targeted for completion by November 1984. In fact, chlorination will consist of an in-line chlorine feed system that will provide a 30-minute contact time for the raw lake water in the intake line. This chlorination system would be used until the chlorine contact/storage reservoir could be constructed. The MDPH, during negotiations with the City, had previously approved the concept of the intake line with in-line chlorination as an interim method of providing water supply to the City while the remainder of the treatment plant was under construction.

However, in discussions at the pre-meeting and in a subsequent comment letter on the FFS, the MDPH indicated that the Lake Michigan intake line should not be used until the entire treatment plant is constructed. The MDPH considers the circumstances to be different now, than when the previous agreements were made. They have decided that the risks to public health from using unfiltered surface water, with only 30 minutes of chlorine contact time, are greater than the predicted chronic cancer risk attributable to concentrations of approximately 40 ppb of TCE in the present water supply.

The initial remedial measure recommended by EPA consists of both a lake water intake and direct filtration plant. The reason that construction will be phased, is because the City had already prepared a detailed design for construction of the intake line. The COE has reviewed the City's design and found it acceptable, with minor revisions to the bid package, for advertisement for a construction contract. The EPA is committed to completing construction of the entire plant in 15 months and the intake line portion within in this year's construction season. Our schedule calls for completion of the intake portion by the end of November 1984, at which time lake water would be available to the City. The decision as to when that water can be used rests with the MDPH, whose responsibility is to regulate public water supply systems in the State.